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BARRICK RESOURCES (USA), INC.

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May 1, 1991

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DIVISION OF
OIL GAS & MINING

Mr. Donald A. Ostler, P.E.
Executive Secretary
Utah Water Pollution Control Committee
P.O. Box 16690
Salt Lake City, Utah 84116-0690

Dear Mr. Ostler:

REF: Notice of Noncompliance: Water Balance Monitoring and Head Control Plan, Ground Water Quality Discharge Permit No. UGW450001.

This letter is in response to your Notice of Noncompliance of April 18, 1991, requiring a ten working day response. Throughout this letter, the Water Balance Monitoring and Head Control Plan, submitted to your office on February 19, will be referenced as the 'Plan.'

Water Balance Monitoring

1. *Utilized Porosity in the Vadose Zone (δN) - after careful review of the water balance equation presented for Dump 3 in Section 1.2.a of the plan and discussions with Barrick staff we have determined that two significant issues exist regarding δN:*

   a) *No practical method to independently measure the utilized vadose zone porosity exists, with a reasonable degree of certainty for dump leach No. 3, and*

   b) *Barrick's current practice is to set the water balance ratio of inflows to outflows equal to 1.0 and then back-calculate an appropriate value for δN.*

   This practice nullifies the purpose of water balance monitoring, in that the ratio is never allowed to deviate; δN is not independently measured; and that the equation represents two unknowns, δN and uncollected leakage. Consequently, an acceptable plan will include a water balance equation and an inflow/outflow ratio that ignores δN, allows for ratio deviation from 1.0, and provides for the independent measurements of all parameters. We recognize that this will result in an inflow/outflow ratio that will be greater than 1.0 even when leakage from the system may not exist. However, this should not pose a problem so long as an appropriate upper limit is established for monitoring. Barrick must also provide a justifiable value for this upper limit.

Barrick Mercur Gold Mine
P.O. Box 838, Tooele, Utah 84074 Telephone (801) 268-4447 FAX(801) 266-4296

(a)

Milling records indicate ore at Mercur ranges from three to six percent moisture. This has been corroborated with heap leach column tests. Leaching adds an additional four to five percent, resulting in an operating moisture of seven to eleven percent. As such, it is probable that this range is the expected moisture within an active heap. Saturated ore, at a porosity of 23.7 percent, is at 13.1 percent moisture.

The lag between initial charging and report of solution in December 1990 supports the operational figures. The initial leach panel had 21,893 tons in the vadose zone, with an apparent 419 tons of additional water on the first day of production (Dec. 21). Thus, at that time, the added water content was approximately 1.9 percent, or 3.5 percent utilized porosity. During the month, the vadose zone moisture content increased to approach saturation at 13 percent, and subsequent records indicate the heap remains in that range.

(b)

This approach is reasonable, as shown in the accompanying Fig. 1. The vadose zone functions in a surge capacity, with all inflows and outflows known. The logic diagram within Fig. 1 should clarify these relationships. Though not directly measured, the vadose zone flow can be resolved algebraically.

This practice does not nullify the purpose of water balance monitoring. The equation does not represent two unknowns, as the leakage is measured independently. The error analysis can indicate whether significant unmeasured leakage is occurring. Accounting for the vadose zone as a surge member is in fact the only means of achieving a reliable balance. It then becomes a prudent calculation in the operation and analysis of the system.

Any flow balance which ignores the vadose zone component is improper. Furthermore, the intent to evaluate such a balance on a daily basis also is compromised since the vadose zone serves the same role as a surge tank. Omission of a surge member within a flow network renders the network mathematically insoluble.

Barrick's approach is realistic and technically supportable. Barrick will continue to record all apparent flows in the manner described in the Water Balance Monitoring and Head Control Plan, or as amended by this letter.

2. *Precipitation Measurements - we agree with your staff that precipitation measurements made at the guard station may not be entirely representative at the Dump Leach No. 3 site. Consequently, an acceptable plan will include on-site measurements of precipitation. We anticipate that Barrick*

will immediately implement rain gauge monitoring of precipitation at Dump Leach No. 3. This change should increase the accuracy of precipitation monitoring, therefore, please update the margin of error (+/- 5%) provided in the report and on Table I.

On-site measurement of precipitation at Dump Leach 3 will begin the week of April 29, 1991, with the placement of a standard precipitation rain gauge, similar to the current gauge being utilized at the Mercur Guard station. The new gauge will be read and recorded by the Dump Leach operator on a daily basis.

The accuracy of precipitation monitoring (+/- 5%) is not dependent upon location. The error is estimated on the ability to visually read the meniscus of water in a standard rain gauge tube at the level of precipitation normally encountered in any 24 hour day (less than 0.10 inches). Therefore, the placement of a second precipitation rain gauge at the Dump Leach 3 plant site will not result in an update of the margin of error. That margin will remain at +/- 5%, as was provided in the Plan.

3. *Sensitivity of Change in Saturated Storage (δS) - review of the plan indicated very little supporting information for the error associated with the storage change, δS. Please submit detailed information to justify the +/- 12.5% error stated. In addition, the maximum daily volume change should be based on the maximum head which as yet has not been agreed upon. Another major element of this justification which must be fully explored is the sensitivity of head measurements. As outlined on Table VI, the existing system is only able to measure head in the dump leach to the nearest 0.23 ft (2.76 in). Based on discussions with your staff, the stage equation for the dump leach is known to the nearest 0.1 ft (1.2 in); therefore, the head measurements in the pregnant liquor cistern should be at least as sensitive (0.1 ft), if not more so. A detailed description of how δS is calculated should be included in the plan.*

The storage volume change (δS) is calculated using the storage volume associated with the average vertical head of the pregnant liquor pool for any given day, less the storage volume for the previous day. The storage volume change takes an opposite sign of the actual change due to its location on the inflow side of the water balance equation. Thus, as the storage volume increases from one day to the next, that associated water is removed from the inflow volume. This approach follows accepted hydrologic convention.

The individual storage volume numbers are obtained from the stage-storage table (see attached Table I) showing an equivalent process pool volume for each 0.1 feet of vertical head. The vertical head is obtained using the Dump Leach 3 cistern level conversion table

(Table II). This shows the vertical head for each 0.05 psi increment taken from the bubbler tube pressure gauge located at the top of the pregnant liquor cistern.

The error associated with the storage volume change is based on the sensitivity of the bubbler tube pressure gauge. The gauge currently being utilized is considered to be the optimum for sensitivity on this system and can be read to the nearest 0.125 psi by estimation between the smallest gradations. This pressure reading is equivalent to a sensitivity of 0.14 foot of head. At that sensitivity, an error is recognized for each level of the stage-storage table. The error ranges from 10,105 gallons at 15.0 feet of head to 39,443 gallons at 30.0 feet of head.

Knowing this sensitivity allows an assessment of the error associated for any change in storage volume. The error in a difference is equal to the sum of the absolute values of the errors in the quantities being subtracted. When expressed as a percentage, which is unconventional, the error is then divided by the difference in quantities, and multiplied by 100. Thus:

$$\delta S = S_1 - S_2 \tag{1}$$

adding in the error terms

$$= (S_1 \pm E_1) - (S_2 \pm E_2) \tag{2}$$

or

$$= S_1 - S_2 \pm (|E_1| + |E_2|) \tag{3}$$

$$= S_1 - S_2 \pm |E| \tag{4}$$

Expressed as a percentage, equation (3) becomes:

$$\delta S = S_1 - S_2 \pm \frac{(|E_1| + |E_2|)\ 100}{(S_1 - S_2)} \tag{5}$$

or

$$\delta S = S_1 - S_2 \pm \frac{|E|\ 100}{(S_1 - S_2)} \tag{6}$$

Applying equation (5) to the stage-storage table indicates the possible percent error variation.

When δS is 15.0 feet, the error, E, is ± 1.07 percent.
When δS is 0.1 foot, E is ± 141.13 percent.

Rather than requesting an allowance for a 140 percent error, it is perhaps more reasonable to consider the existing operational data.

During the first 111 days of 1991, the average process pool elevation change per day was approximately 1.0 foot. This calculates to a ± 13.9 percent error for the 15.0 - 16.0 foot interval. At the 29.0 - 30.0 interval, the error is ± 14.1 percent.

Barrick offers that in order to simplify calculations, a value of ± 14.0 percent will be utilized in reporting the error associated with the change in storage volume. This will facilitate the Bureau's work, as no verification of variable error will be required. The ± 12.5 percent error previously utilized in the plan was based on data collected at the time the Plan was written.

The maximum daily volume change can not be based on the maximum head as stated in your Notice of Noncompliance. The volume change occurs by pumping pregnant liquor from the dump leach or adding barren solution to the dump leach. The rates are limited to the pump and/or piping capacities.

At the pump design capacity of 1,200 gallons per minute, approximately 1,728,000 gallons can be removed or added to the dump leach in any 24 hour period. This represents approximately 12.8 feet of head when measured from the pool bottom upwards. When drawn from the thirty foot level downward, it represents a drop of 8.9 vertical feet.

4. *Leakage Flow Sensitivity - sensitivity of measurements of the leakage collection system must be based on the capacity of the leak detection channel (burrito) of the upper leakage detection system to transmit water, not the design capacity of the drainage pipes which convey it through the dam.*

The flow capacity of the leak detection channel is approximately 2.75 gallons per minute. This is considerably less than the 400 gallons per minute capacity of the collection pipes themselves. The flow rates in Table IV of the Plan will be adjusted accordingly.

5. *Inflow/Outflow Ratio Error - inflow/outflow error as defined on page 8 of the plan, where the total error is divided by the total inflow volumes, causes the error to appear lower than reality since the total error is a much smaller number than the large inflows to the dump leach. The error should be calculated as the sum of the inflow errors divided by the sum of the outflow errors, which will result in a much larger relative percentage.*

Equation (10) on page 8 of the Plan is an empirical reduction of the following steps.

The balance under consideration has a ratio variance (V_R) of:

$$V_R = \frac{I + P + \delta S + \delta N}{O + E + L}$$ (7)

This is equation (9) of the Plan.

The error associated with this ratio is

$$V_R \pm E_R = \frac{I + P + \delta S + \delta N \pm [E_I + E_P + E_S + E_N]}{O + E + L \pm [E_O + E_E + E_L]}$$ (8)

and

$$V_R \text{ (max)} = \frac{I + P + \delta S + \delta N + [E_S + E_P + E_S + E_N]}{O + E + L - [E_O + E_E + E_L]}$$ (9)

and

$$V_R \text{ (min)} = \frac{I + P + \delta S + \delta N - [E_I + E_P + E_S + E_N]}{O + E + L + [E_O + E_E + E_L]}$$ (10)

The values used in the Plan were for January, 1991. They are repeated below:

I =	29,515,982	±	147,587
P =	1,351,387	±	67,569
δS =	382,417	±	47,802
δN =	(372,224)		
O =	(30,814,849)	±	154,077
E =	(62,713)	±	6,271
L =	(0)	±	0

Using these values in equation (9), the maximal error becomes:

$$V_R \text{ (max)} = (29,515,982 + 1,351,387 + 382,417 + (372,224) + [147,587 + 67,569 + 47,802])/(30,814,849 + 62,713 + 0 - [154,077 + 6,271 + 0])$$

$$= \frac{30,877,562 + 262,958}{30,877,562 - 160,348}$$

$$V_R \text{ (max)} = 1.0138$$

Substituting into equation (10), the minimal error becomes:

$$V_R \text{ (min)} = (29,515,982 + 1,351,387 + 382,417 + (372,224) - [147,587 + 67,569 + 47,802])/(30,814,849 + 62,713 + 0 + [154,077 + 6,271 + 0])$$

$$= \frac{30,877,562 - 262,958}{30,877,562 + 160,348}$$

$$V_R \text{ (min)} = 0.9864$$

Thus, the error range is 0.0274. The total error, E_T, is commonly expressed as a half range:

$$E_T = \pm\ 0.0137$$

Thus,

$$V_R = 1.0 \pm 1.37\%$$

Equation (10) on page 8 of the Plan used symmetry to express the same result.

Under no circumstances can the error be calculated as the sum of the inflow errors divided by the sum of the outflow errors.

6. *Confirmation of Flow Ratio Limit Violations - the sequence of the confirmation action outlined in Section 1.4.a must be first, check the records and second, check the measurements; not one or the other. In the case of rechecking the flow measurements, Barrick must define which backup flow gauges will be used and their corresponding sensitivity. These backup flow gauges must have equal or better sensitivity as the primary flow gauges, with detailed records kept of their measurements. Detailed description must be included on how head measurements will be checked or validated once a flow ratio limit has been violated (see comment below).*

The confirmation of flow ratio limit violations was presented in response to both verbal and written requests from the Bureau. In your letter of January 31, 1991, under the Water Balance Monitoring Plan, paragraph 4, you wrote:

> 4. Remedy to Flow Limit Violations - Any remedy must include: 1) actions to confirm the violation, such as rechecking records or measurements

The existing backup meters are shown in the Plan, on Table I and in Appendix B. These are the mechanical flow meters. Barrick is in the process of replacing these with the magnetic meters shown on Table I and Appendix A of the Plan. This standardization of flow meters is being done for operational considerations.

We believe the confirmation description in the Plan (Sec. 1.4.a, pp. 8-9) is sufficiently clear and detailed for the plant operations staff. It adequately addresses your current request and that of January 31.

7. *Evaporation Sensitivity - we agree with your staff that evaporation error is a significant part of the total flow measurement error. We also recognize that the evaporation rate of barren solution in contact with the subore may vary significantly from rates for water in contact with bare soil and vegetated surfaces. Consequently, until the evaporation rate and error is further defined by the studies promised on June 1, 1991, the Executive Secretary will not be able to approve the Water Balance Monitoring Plan.*

In the January correspondence (op. cit., paragraph 2), the Bureau stated:

> We do agree that additional operational data will refine the tolerance limits of such measurements, and we are willing to adjust or modify these limits accordingly.

The tests to which you allude have to date been unsuccessful due to icing. By June 1, if our site studies remain inconclusive, Barrick believes the Bureau would be justified in approving the water balance using our long-term evaporation data, or appropriate equivalent data from similar gold leach facilities. At a minimum, the Bureau should approve conditionally the water balance pending more pertinent data collection periods in 1991.

<u>*Head Control Plan*</u>

1. *Head Measurement Sensitivity - Part I E 7(d) of the permit requires head measurements in Dump Leach No. 3 to be made to the nearest 0.1 ft. Table VI of the plan indicates the existing system cannot meet this requirement. As a result, Dump No. 3 is not being operated in compliance with the Ground Water Permit. Barrick must immediately modify the head monitoring system to comply with Part I E 7(d) of the permit or be subject to possible compliance action.*

Please see the above response to Item 3 under Water Balance Monitoring. Table II of this letter supersedes Table VI of the Plan. Barrick is and always has been in compliance with the Conditional Approval Order and the intent of the Ground Water Quality Discharge Permit.

2. *Daily Maximum Head Limit - reference is made to the difficulty of controlling the head level in the dump below 25 ft, due to snow melt without any information provided on the average and maximum snow pack expected, its corresponding water content, or the rate at which it may melt. These additional data are necessary to justify the proposed daily maximum head of 25 ft.*

The difficulty in maintaining the head level in the dump below 25 feet is not solely due to snow melt, as was referred to in your Notice. Barrick stated in the Plan that snow melt is a small part of the overall flow system. That system includes but is not limited to flow lag through the ore heap, evaporation, precipitation, emitter installation and ore loading.

The snow pack and water content is provided below for your reference:

- 1987-1990 average annual snow pack = 82.10 inches (6.84 ft.)

- 1987-1990 average moisture content = 9.22%

- 1990: maximum annual snow pack = 89.75 inches (7.48 ft)

- April 1987: maximum moisture content = 23.3%

3. *Confirmation of Head Violations - the sequence of the confirmation action outlined in Section II.3.a must be to first check the records and then check the measurements (not one or the other). Since head measurements are not reported to the Environmental/Occupational Health Department until after completion of the shift, it appears that the checking of the measurements as proposed will be limited to only rereading the gauge several hours later if not the next day after the original measurement. Confirmation checking of the head measurements must include either:*

   a) Maintenance of a separate method of continuous measurement and records thereof which allows the staff to compare measurements between the two methods at a later date for any given time, and/or

   b) Confirmation of the calibration of the existing equipment by measuring the head in the pregnant cistern by a separate method and comparing the result with that of the existing equipment.

The misunderstanding here is similar to that noted earlier regarding flow ratio limits. In the letter of January 31, under the Head Control Plan, paragraph 3, the Bureau wrote:

> This plan must include: 1) actions to confirm the violation of the head limit, such as rechecking records or measurements

The interpretation of measurement checking is in error. A measurement error generally will be detected in the following ways:

1. Immediately

2. Upon recording (coincident with or immediately after measurement)

3. Upon comparison with previous records (coincident with or immediately after 2. above)

4. Upon taking the subsequent measurement (3 hr interval).

The time frame involved in steps 1, 2, and 3 above is to be measured in seconds, possibly minutes, but not hours. There is not and never has there been an intent for the Environmental/ Occupational Health Department to regularly check measurements. This is purely an operations function. The E/OH personnel are copied on the data, but are not involved in production measurements.

The largest probable time lag for confirmation is the measurement interval of three hours. This allows sufficient time for corrective actions to remedy all probable head violations. The Permit provides for 24 hours to remedy these violations.

(a)

The existing high level alarms and the recording protocol already achieve this intent. Continuous recording devices will only duplicate the existing system's ability to alert the operator when approaching the high level limit.

(b)

A separate method is not required to confirm the calibration of the existing bubbler tube system. The five level probes already provide an independent calibration. Installation of a separate method would involve placing personnel in the bottom of a 244-foot long inclined cistern, in direct contact with a cyanide solution.

In summary, Barrick maintains Dump Leach 3 is and always has operated in compliance with the Conditional Approval Order and the Ground Water Quality Discharge Permit No. UGW450001.

Upon satisfactory resolution of these responses, they will be incorporated into a revised Water Balance Monitoring and Head Control Plan. Please notify us within ten working days as to your proposed resolution. That will allow timely action upon our March 15, 1991 request for extension of your December 18, 1990 Conditional Approval Order.

If you have any questions or comments, please contact Ralph Sacrison at 268-4447. We appreciate your continued cooperation and understanding.

Sincerely,

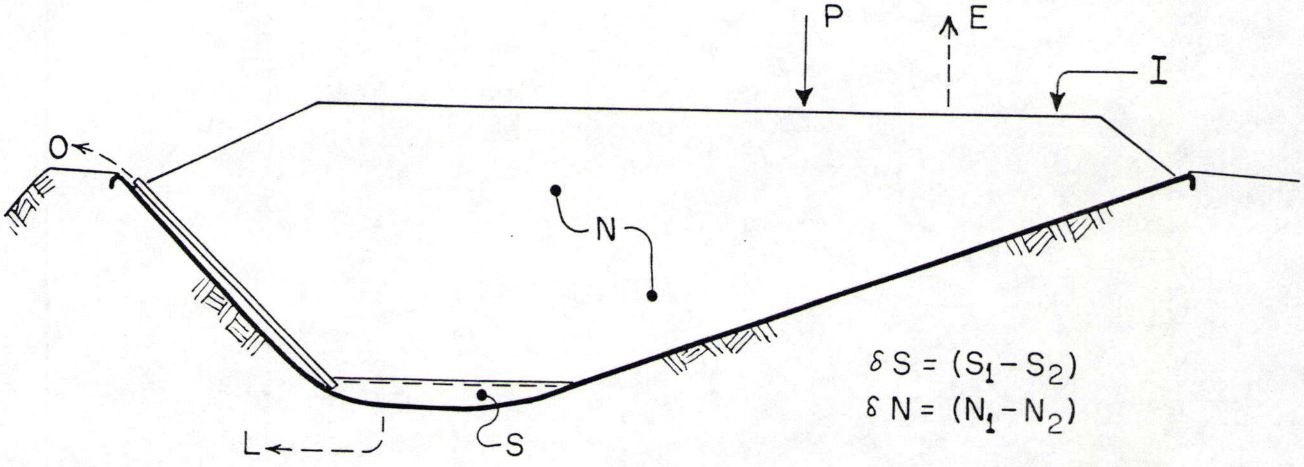
Frank D. Wicks
Vice President and General Manager

FDW:ms

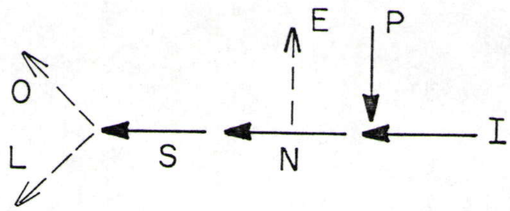
Enclosures (3)

cc: D. P. Beatty
G. M. Eurick
T. B. Faddies
C. L. Landa
C. L. Olsen
M. P. Richardson
R. R. Sacrison
Ken Alkema, Division Environmental Health
Grant Bagley, Assistant Attorney General
George Condrat, Dames and Moore
Wayne Hedberg, Division Oil Gas and Mining
Joe Trujillo, Tooele County Health Department

DUMP LEACH 3 WATER BALANCE



SCHEMATIC CROSS SECTION
(Showing Flow Components)



LOGIC DIAGRAM

The Hydrologic Balance for this System is :

$$I + P + \delta S + \delta N - O - E - L = 0$$

Where :

- I = Inflow (Barren Solution)
- P = Precipitation
- δS = Change in pool volume. δS is positive with a reduction in storage and negative with an increase in volume.
- δN = Change in utilized pore volume in the vadose zone. This follows the same sign convention as δS.
- O = Outflow (Pregnant Solution)
- E = Evaporation
- L = Leakage

Figure 1.

PROCESS POOL ------ DUMP LEACH 3

ELEV	VERTICAL POOL HEIGHT	GALLONS	ELEV	VERTICAL POOL HEIGHT	GALLONS	ELEV	VERTICAL POOL HEIGHT	GALLONS
7049.0	15.0	472,382	7054.0	20.0	936,777	7059.0	25.0	1,648,678
7049.1	15.1	479,600	7054.1	20.1	948,215	7059.1	25.1	1,666,446
7049.2	15.2	486,818	7054.2	20.2	959,875	7059.2	25.2	1,684,214
7049.3	15.3	494,333	7054.3	20.3	971,477	7059.3	25.3	1,702,004
7049.4	15.4	501,995	7054.4	20.4	983,471	7059.4	25.4	1,720,105
7049.5	15.5	509,657	7054.5	20.5	995,575	7059.5	25.5	1,738,317
7049.6	15.6	517,431	7054.6	20.6	1,007,791	7059.6	25.6	1,756,641
7049.7	15.7	525,426	7054.7	20.7	1,020,117	7059.7	25.7	1,775,075
7049.8	15.8	533,382	7054.8	20.8	1,032,383	7059.8	25.8	1,793,860
7049.9	15.9	541,600	7054.9	20.9	1,044,931	7059.9	25.9	1,812,738
7050.0	16.0	549,929	7055.0	21.0	1,057,480	7060.0	26.0	1,831,617
7050.1	16.1	558,369	7055.1	21.1	1,070,140	7060.1	26.1	1,850,718
7050.2	16.2	566,808	7055.2	21.2	1,082,799	7060.2	26.2	1,870,040
7050.3	16.3	575,317	7055.3	21.3	1,095,507	7060.3	26.3	1,889,710
7050.4	16.4	583,868	7055.4	21.4	1,108,389	7060.4	26.4	1,909,587
7050.5	16.5	592,419	7055.5	21.5	1,121,271	7060.5	26.5	1,929,687
7050.6	16.6	600,969	7055.6	21.6	1,134,263	7060.6	26.6	1,950,231
7050.7	16.7	609,520	7055.7	21.7	1,147,367	7060.7	26.7	1,971,330
7050.8	16.8	618,139	7055.8	21.8	1,160,517	7060.8	26.8	1,992,658
7050.9	16.9	626,801	7055.9	21.9	1,173,732	7060.9	26.9	2,014,535
7051.0	17.0	635,574	7056.0	22.0	1,187,169	7061.0	27.0	2,036,744
7051.1	17.1	644,458	7056.1	22.1	1,200,606	7061.1	27.1	2,059,065
7051.2	17.2	653,453	7056.2	22.2	1,214,265	7061.2	27.2	2,081,496
7051.3	17.3	662,514	7056.3	22.3	1,228,077	7061.3	27.3	2,104,372
7051.4	17.4	671,731	7056.4	22.4	1,241,959	7061.4	27.4	2,127,470
7051.5	17.5	680,948	7056.5	22.5	1,255,840	7061.5	27.5	2,150,790
7051.6	17.6	690,277	7056.6	22.6	1,269,832	7061.6	27.6	2,174,220
7051.7	17.7	699,605	7056.7	22.7	1,283,824	7061.7	27.7	2,197,762
7051.8	17.8	708,997	7056.8	22.8	1,297,968	7061.8	27.8	2,221,192
7051.9	17.9	718,659	7056.9	22.9	1,312,294	7061.9	27.9	2,245,178
7052.0	18.0	728,431	7057.0	23.0	1,326,953	7062.0	28.0	2,269,385
7052.1	18.1	738,203	7057.1	23.1	1,341,611	7062.1	28.1	2,293,704
7052.2	18.2	747,976	7057.2	23.2	1,356,381	7062.2	28.2	2,318,023
7052.3	18.3	757,700	7057.3	23.3	1,371,188	7062.3	28.3	2,342,447
7052.4	18.4	767,472	7057.4	23.4	1,386,068	7062.4	28.4	2,367,322
7052.5	18.5	777,467	7057.5	23.5	1,401,282	7062.5	28.5	2,392,529
7052.6	18.6	787,572	7057.6	23.6	1,416,718	7062.6	28.6	2,417,848
7052.7	18.7	797,678	7057.7	23.7	1,432,265	7062.7	28.7	2,443,166
7052.8	18.8	807,954	7057.8	23.8	1,447,956	7062.8	28.8	2,468,364
7052.9	18.9	818,393	7057.9	23.9	1,463,725	7062.9	28.9	2,493,905
7053.0	19.0	828,832	7058.0	24.0	1,479,716	7063.0	29.0	2,519,445
7053.1	19.1	839,270	7058.1	24.1	1,495,819	7063.1	29.1	2,545,319
7053.2	19.2	849,820	7058.2	24.2	1,512,032	7063.2	29.2	2,571,303
7053.3	19.3	860,318	7058.3	24.3	1,528,386	7063.3	29.3	2,597,385
7053.4	19.4	870,978	7058.4	24.4	1,545,265	7063.4	29.4	2,623,926
7053.5	19.5	881,750	7058.5	24.5	1,562,145	7063.5	29.5	2,650,576
7053.6	19.6	892,522	7058.6	24.6	1,579,025	7063.6	29.6	2,677,449
7053.7	19.7	903,405	7058.7	24.7	1,596,348	7063.7	29.7	2,705,210
7053.8	19.8	914,344	7058.8	24.8	1,613,697	7063.8	29.8	2,732,951
7053.9	19.9	925,338	7058.9	24.9	1,631,132	7063.9	29.9	2,761,046
						7064.0	30.0	2,789,251

Table I

DUMP LEACH No. 3 - CISTERN LEVEL CONVERSION TABLE
VERTICAL HEAD OF SOLUTION ABOVE LINER

PSI	V. FT. HEAD	PSI	V. FT. HEAD	PSI	V. FT. HEAD	PSI	V. FT. HEAD	PSI	V. FT. HEAD	PSI	V. FT. HEAD
0.00	15.0	1.10	17.5	2.20	20.1	3.30	22.6	4.40	25.1	5.50	27.7
0.05	15.1	1.15	17.7	2.25	20.2	3.35	22.7	4.45	25.2	5.55	27.8
0.10	15.2	1.20	17.8	2.30	20.3	3.40	22.8	4.50	25.4	5.60	27.9
0.15	15.3	1.25	17.9	2.35	20.4	3.45	22.9	4.55	25.5	5.65	28.0
0.20	15.5	1.30	18.0	2.40	20.5	3.50	23.1	4.60	25.6	5.70	28.1
0.25	15.6	1.35	18.1	2.45	20.6	3.55	23.2	4.65	25.7	5.75	28.2
0.30	15.7	1.40	18.2	2.50	20.8	3.60	23.3	4.70	25.8	5.80	28.3
0.35	15.8	1.45	18.3	2.55	20.9	3.65	23.4	4.75	25.9	5.85	28.5
0.40	15.9	1.50	18.5	2.60	21.0	3.70	23.5	4.80	26.0	5.90	28.6
0.45	16.0	1.55	18.6	2.65	21.1	3.75	23.6	4.85	26.2	5.95	28.7
0.50	16.1	1.60	18.7	2.70	21.2	3.80	23.7	4.90	26.3	6.00	28.8
0.55	16.3	1.65	18.8	2.75	21.3	3.85	23.9	4.95	26.4	6.05	28.9
0.60	16.4	1.70	18.9	2.80	21.4	3.90	24.0	5.00	26.5	6.10	29.0
0.65	16.5	1.75	19.0	2.85	21.6	3.95	24.1	5.05	26.6	6.15	29.2
0.70	16.6	1.80	19.1	2.90	21.7	4.00	24.2	5.10	26.7	6.20	29.3
0.75	16.7	1.85	19.3	2.95	21.8	4.05	24.3	5.15	26.9	6.25	29.4
0.80	16.8	1.90	19.4	3.00	21.9	4.10	24.4	5.20	27.0	6.30	29.5
0.85	17.0	1.95	19.5	3.05	22.0	4.15	24.6	5.25	27.1	6.35	29.6
0.90	17.1	2.00	19.6	3.10	22.1	4.20	24.7	5.30	27.2	6.40	29.7
0.95	17.2	2.05	19.7	3.15	22.3	4.25	24.8	5.35	27.3	6.45	29.8
1.00	17.3	2.10	19.8	3.20	22.4	4.30	24.9	5.40	27.4	6.50	30.0
1.05	17.4	2.15	20.0	3.25	22.5	4.35	25.0	5.45	27.5	6.55	30.1

Table II